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(19) (CA) **CANADIAN PATENT** (12)

(54) ORO-PHARYNGEAL SUCTION AIRWAY

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"ORO-PHARYNGEAL SUCTION AIRWAY"

ABSTRACT OF THE DISCLOSURE

5 An oro-pharyngeal apparatus defining both a
suction conduit adapted to receive an operative
connection to a suction pump for removing liquids
from a patient's throat and at least one airway
through which the patient can breath during medical
or dental treatment. The invention allows
10 simultaneous use of the suction conduit and airway.
Alternately, an oxygen pump can be connected to the
conduit for insufflation of the patient.

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"ORO-PHARYNGEAL SUCTION AIRWAY"

Technical Field

15 This invention relates to an oro-pharyngeal
airway and more specifically provides an airway
operable to permit fluids, mucus, blood or vomitus
material to be evacuated from the pharynx without
20 removal of the airway from the patient's mouth, to
permit insufflation of the patient's lungs and to
permit normal breathing of the patient while the
airway is in place.

Background Art

25 The prior art includes a number of airway
designs operable for providing an airway into a
patient's throat area to permit air to enter and
escape during normal breathing. However, during
certain medical conditions, such as following general
30 anesthesia, comatose, emergency conditions or in
newborns, it is necessary to develop suction in the
patient's throat to remove fluids, mucus, blood or
vomitus material. In using most of the prior art
airways, the airway must be removed and a catheter
35 tube inserted in the patient's throat area to perform



the suction operation. Also, most prior art airways must be removed before insufflation of a patient can be effected, unless an oxygen mask or nasal oxygen tube is used. Although certain prior art airways provide a passageway for insertion of a suction tube to evacuate the throat or pharynx, none has provided an integral suction passageway for connection to an external suction apparatus or oxygen supply.

Summary of the Invention

Briefly, the present invention comprises a suction airway defining a breathing passageway as well as a conduit for connection to either a suction means or an oxygen supply means which can be easily attached to the conduit without removing the airway.

More particularly, the invention pertains to an oropharyngeal suction airway comprising an elongate body adapted to extend from a forward end thereof adapted to be engaged by a person's mouth to a rearward end thereof adjacent to the person's pharynx. The body includes enclosed elongate conduit means extending along the length of the body and open at the forward and rearward ends thereof. Means define an elongate airway for breathing by the person, adjacent to the conduit means, and means is located at the forward end of the conduit means for receiving an operative connection to a pump means without obstructing the flow of air through the airway means.

In one aspect, the airway means is defined by a plurality of flanges extending away from the conduit means to form at least one channel.

In another aspect the airway means is defined by a pair of parallel flanges, the flanges being fixed to opposite sides of the conduit means so as to define a pair of channels bounded by the flanges and the conduit means.

In a still further aspect, the airway means is defined by four elongate radial flanges extending radially away from the conduit means, with two parallel bridging flanges each attached to two of the radial flanges so as to form two enclosed air passageways and two open air channels.

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In still another aspect the forward end of the conduit means defines a radial suction control opening therein.

5 In a preferred embodiment the body further includes a pair of parallel flanges defining a straight forward section and a curved rearward section, the flanges being held in spaced apart relation at the straight section by a rigid conduit attached to the flanges, and at the curved section by a plurality of longitudinally spaced apart, laterally staggered tab elements. The flanges define lip elements at the forward ends thereof for
10 engaging the outside of a person's mouth, one of the lip elements defining a radial suction control opening therein in communication with the interior of the rigid conduit. A flexible conduit extends along the body between the flanges and between the staggered tab elements to be frictionally received within the
15 rearward end of the rigid conduit. The rigid conduit defines at its forward end a tapered end for frictionally receiving a tube connected to a pump means.

The airway of the invention will function only as an airway during certain conditions, and will function as a
20 combination airway and pharynx evacuator when necessary.

The invention also provides a pharynx evacuation system which can be used in combination with a standard anesthesia mask and connection means and can be used with patient insufflation systems.

25 These and other aspects and advantages of the details of construction will become apparent after reading the following description of the illustrative embodiment, with reference to the attached drawings.

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Brief Description of the Drawing

5 Fig. 1 is a side elevational view taken longitudinally along an oro-pharyngeal suction airway embodying the present invention.

Fig. 2 is a cross sectional view taken along lines 2--2 of Fig. 1.

10 Fig. 3 is a cross sectional view taken along lines 3--3 of Fig. 1.

Fig. 4 is a diagrammatic representation of an airway embodying the invention in position within a patient's mouth and throat.

15 Fig. 5 is a perspective view of a second embodiment of the oro-pharyngeal suction airway of the present invention.

Fig. 6 is a cross sectional view taken along line 6--6 of Fig. 5, appearing with Figs. 1, 2, 3 and 7.

20 Fig. 7 is a cross sectional view of the body of a third embodiment of the oro-pharyngeal suction airway of the present invention, with Figs. 1-3 and 6.

Detailed Description

Referring now in more detail to the drawing, in which like numerals represent like parts throughout the several views, Fig. 1 shows a side
25 elevational view of an oro-pharyngeal suction airway 10 embodying the invention. The suction airway 10 includes an elongate body 11 formed of a suitable rigid material, such as a lightweight plastic that
30 can be injection molded into the desired shape. The body 11 includes a forward straight section 12 and a rearward curved section 13 defined by a pair of longitudinally extending parallel flange elements 16 and 17. The flange elements 16 and 17 are held in
35 spaced apart relation by a plurality of tab elements

— 18 that are preferably formed integrally with the flange elements 16 and 17. The tab elements 18 are preferably conveniently spaced along the length of the body 11 on alternating sides of the centerline of
5 the flange elements 16 and 17.

Also separating and supporting the flange elements 16 and 17 at the forward end of the body 11 is a rigid conduit section 21 fixed to or integrally formed with the flange elements 16 and 17. The
10 conduit section 21 extends rearwardly between the flange elements 16 and 17 for the greater portion of the straight section 12 of the body 11. The conduit section 21 also extends forwardly to terminate in a nipple element 22 having a tapered shape to receive
15 and frictionally retain a tubular conduit 30, as shown in Fig. 4, the tube 30 being connected to a suction pump apparatus (not shown). The nipple element 22 is also shaped to terminate at its rearward end in a shoulder 26 that provides an
20 annular sealing flange to matingly receive a complementary opening formed in a standard anesthesia mask (not shown).

In the preferred embodiment of the invention, as shown in Figs. 1-3, a length of
25 flexible tubing 14 is inserted from a rearward end of the curved section 13 longitudinally along the center of the body 11 between the tabs 18, until the forward end 15 of the tube 14 enters the conduit section 21 and extends therein for a portion of the length of
30 the conduit section 21. The penetration of the tube 14 into the conduit section 21 is shown in dashed lines in Fig. 1. As a result, the tube 14 and the conduit section 21 form a continuous passageway between the extreme ends of the body 11. This
35 passageway can be used to evacuate fluids from the

- patient's throat or to insufflate the patient's lungs
by connection of an appropriate suction or oxygen
supply tube to the nipple 22. At the same time, the
5 parallel flange elements 16 and 17 extend beyond the
diameter of the tube 14 and the tabs 18 so that the
cross section of the suction airway 10 is in the form
of an "H", as shown in Fig. 3. It will be seen that
a pair of sidewardly opening channels 19 and 20 are
10 formed by the flange elements 16 and 17 and the tube
14. The channels 19 and 20 provide airways through
which the patient can breathe, as will be explained
in detail hereinafter.

Referring again to Fig. 1, the flange
elements 16 and 17 terminate at the middle portion of
15 the conduit section 21 in a pair of lip elements 23
and 24 extending at right angles away from the
conduit section 21 and then extending forwardly and
toward the conduit section 21 to form arcuate
elements 23a and 24a, respectively. The arcuate
20 portion 23a is connected to the exterior of the
conduit section 21 by a connecting block 27, and a
vent opening 28 extends downwardly through the
arcuate portion 23a, the block 27 and the conduit
section 21 to communicate with the hollow interior of
25 the conduit section 21.

To improve the suctioning or aerating
capability of the suction airway 10, a plurality of
openings 29 can be made radially into the sides of
the tube 14 adjacent to its rearward end, as shown in
30 Fig. 1.

In operation of the oral-pharyngeal suction
airway 10, the device is inserted into the patient's
mouth until the curved rear section 13 extends into
the back of the patient's throat adjacent to the
35 pharynx. The lip elements 23 and 24 are placed

— against the outer surface of the patient's lips and the patient is instructed to bite down on the forward straight portion 12 of the flange elements 16 and 17, as shown in Fig. 4. At this time, the patient is
5 able to breathe through the airways defined by the channels 19 and 20. If no other apparatus is connected to the nipple 22, then the patient can also breathe through the tube 14 and conduit section 21. In the placement of the suction airway 10, the
10 attending person can grasp the arcuate portions 23a and 24a with the fingers in order to control the location of the suction airway 10.

When it is necessary to perform a throat evacuation to remove fluid, mucus, blood or vomitus
15 material from the throat, a flexible tubular conduit 30 is frictionally engaged over the projecting nipple 22. A suction pump apparatus also connected to the tube 30 is operated to create suction within the tube 14 to withdraw such fluids from the patient's throat. This can be accomplished without removing the suction
20 airway 10 from the patient's mouth. Alternately, insufflation of the patient's lungs can be accomplished by connecting the tube 30 to an oxygen supply apparatus in order to pump a stream of oxygen
25 out of the end of the tube 14 down the patient's throat to the patient's lungs. During either suction or oxygen supply operations, the patient is still able to breathe through the channels 19 and 20. The vent opening 28 can be used as a valve to control the
30 strength of suction by means of the attending person's fingertip closing off all or a portion of the opening 28. If continuous full strength suction is desired, the opening 28 can be plugged with a rubber stopper (not shown) or the like.

35 A second embodiment of the oral-pharyngeal

suction airway embodying the present invention is shown in Figs. 5 and 6, designated by the reference numeral 110. The suction airway 110 includes a cylindrically shaped central conduit 114 beginning in a nipple portion 113 and extending rearwardly through a straight section 111 followed by a curved section 112. Four longitudinally extending flange elements 115, 116, 117 and 118 project outwardly from the central conduit 114. Four airway channels 130, 131, 132 and 133 are thus defined between adjacent radially extending flanges. If desired, the suction airway can be utilized as just described, with the patient biting down directly on the radially extending flanges 115-118. However, the suction airway 110 preferably includes a pair of parallel bridging flanges 119 and 120 (analogous to flanges 16 and 17 in Fig. 1) which bridge the radially extending flanges 115 and 116, and 117 and 118, respectively, as best shown in Fig. 6. The parallel flanges 119 and 120 extend from the rearward end of the curved section 112 to a point adjacent to the nipple portion 113, at which point the flanges extend at right angles away from the conduit 114 to form lip elements 121 and 122. It will be seen that the airways 131 and 133 are enclosed airway channels, whereas the airways 130 and 132 are open channels.

Operation of the second embodiment of the invention shown in Fig. 5 is accomplished in a manner similar to that described for the first embodiment shown in Fig. 1. Suction or insufflation is provided through the conduit 114 by connection of a suction apparatus or oxygen supply apparatus to the nipple portion 113. The airways permit the patient to breathe while the suction is operating. A ring 123 can be provided on the forward surface of one of the

lip elements 121 and 122 to provide a means for grasping the section airway 110 for placement in the patient's mouth and for permitting the section airway 110 to be stored on a hook.

5 A third embodiment 150 of the oro-pharyngeal suction airway of the invention is shown in cross section in Fig. 7, looking toward the forward end of the apparatus. A central conduit 151 has extending therefrom four radial flanges 152-155. 10 No bridging flanges are present in the embodiment of Fig. 7, but the radial flanges 152-155 form open airway channels therebetween and terminate in lip elements 161 and 162, which function in the same manner as the lip element described in connection with the other embodiments. In other respects, the 15 airway shown in Fig. 7 is similar to the first and second embodiments described above, with the exception that flanges 152-155 are not separated by right angles. The angle between flanges 152 and 154 and between flanges 153 and 155 is smaller than the 20 angle between flanges 152 and 153 and between flanges 154 and 155.

It will be understood by those skilled in the art that the above-described embodiments of the 25 oro-pharyngeal suction airway of the present invention can be constructed of various materials, so long as the portion of the apparatus onto which the patient bites is sufficiently rigid so that it will not readily collapse under the pressure of the 30 patient's jaws. The various elements of the suction airways can be made separately and attached together, or can be integrally molded by well known injection molding techniques. For example, the flexible tube 14 that is disclosed as being inserted into the body 35 11 of the embodiment 10 shown in Fig. 1 can be an

— integral conduit formed at the same time as the remainder of the body 11. In this case, the tabs 18 would not be necessary.

5 While this invention has been described in detail with particular reference to preferred embodiments thereof, it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinbefore and as defined in the appended claims.

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The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An oro-pharyngeal suction airway comprising an elongate body adapted to extend from a forward end thereof adapted to be engaged by a person's mouth to a rearward end thereof adjacent to the person's pharynx, said body including:

enclosed elongate conduit means extending along the length of said body and being open at the forward and rearward ends thereof;

means defining an elongate airway for breathing by said person, adjacent to said conduit means;

means located at the forward end of said conduit means for receiving an operative connection to a pump means without obstructing the flow of air through said airway means;

said airway means being defined by a plurality of flanges extending away from said conduit means to form at least one channel.

2. An oro-pharyngeal suction airway comprising an elongate body adapted to extend from a forward end thereof adapted to be engaged by a person's mouth to a rearward end thereof adjacent to the person's pharynx, said body including:

enclosed elongate conduit means extending along the length of said body and being open at the forward and rearward ends thereof;

means defining an elongate airway for breathing by said person, adjacent to said conduit means;

means located at the forward end of said conduit means for receiving an operative connection to a pump means without obstructing the flow of air through said airway means;

said airway means being defined by a pair of parallel flanges, said flanges fixed to opposite sides of said conduit means so as to define a pair of channels bounded by said flanges and said conduit means.

3. An oro-pharyngeal suction airway comprising an elongate body adapted to extend from a forward end thereof adapted to be engaged by a person's mouth to a rearward end thereof adjacent to the person's pharynx, said body including:

enclosed elongate conduit means extending along the length of said body and being open at the forward and rearward ends thereof;

means defining an elongate airway for breathing by said person, adjacent to said conduit means;

means located at the forward end of said conduit means for receiving an operative connection to a pump means without obstructing the flow of air through said airway means;

said airway means being defined by four elongate radial flanges extending radially away from said conduit means; and two parallel bridging flanges each attached to two of said radial flanges so as to form two enclosed air passageways and two open air channels.

4. An oro-pharyngeal suction airway comprising an elongate body adapted to extend from a forward end thereof adapted to be engaged by a person's mouth to a rearward end thereof adjacent to the person's pharynx, said body including:

enclosed elongate conduit means extending along the length of said body and being open at the forward and rearward ends thereof;

means defining an elongate airway for breathing by said person, adjacent to said conduit means;

means located at the forward end of said conduit means for receiving an operative connection to a pump means without obstructing the flow of air through said airway means;

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the forward end of said conduit means defining a radial suction control opening therein.

5. The apparatus of Claim 1, wherein said means for receiving an operative connection to a pump means comprises a tapered conduit end shaped to receive and frictionally retain a flexible conduit connected to said pump means.

6. The apparatus of Claim 5, wherein said pump means comprises a suction pump.

7. The apparatus of Claim 5, wherein said pump means comprises an oxygen supply pump.

8. An oro-pharyngeal suction airway comprising an elongate body adapted to extend from a forward end thereof adapted to be engaged by a person's mouth to a rearward end thereof adjacent to the person's pharynx, said body including:

enclosed elongate conduit means extending along the length of said body and being open at the forward and rearward ends thereof;

means defining an elongate airway for breathing by said person, adjacent to said conduit means;

means located at the forward end of said conduit means for receiving an operative connection to a pump means without obstructing the flow of air through said airway means;

said body further including:

a pair of parallel flanges defining a straight forward section and a curved rearward section;

said flanges being held in spaced apart relation at said straight section by a rigid conduit attached to said flanges, and at said curved section by a plurality of longitudinally spaced apart, laterally staggered tab elements;

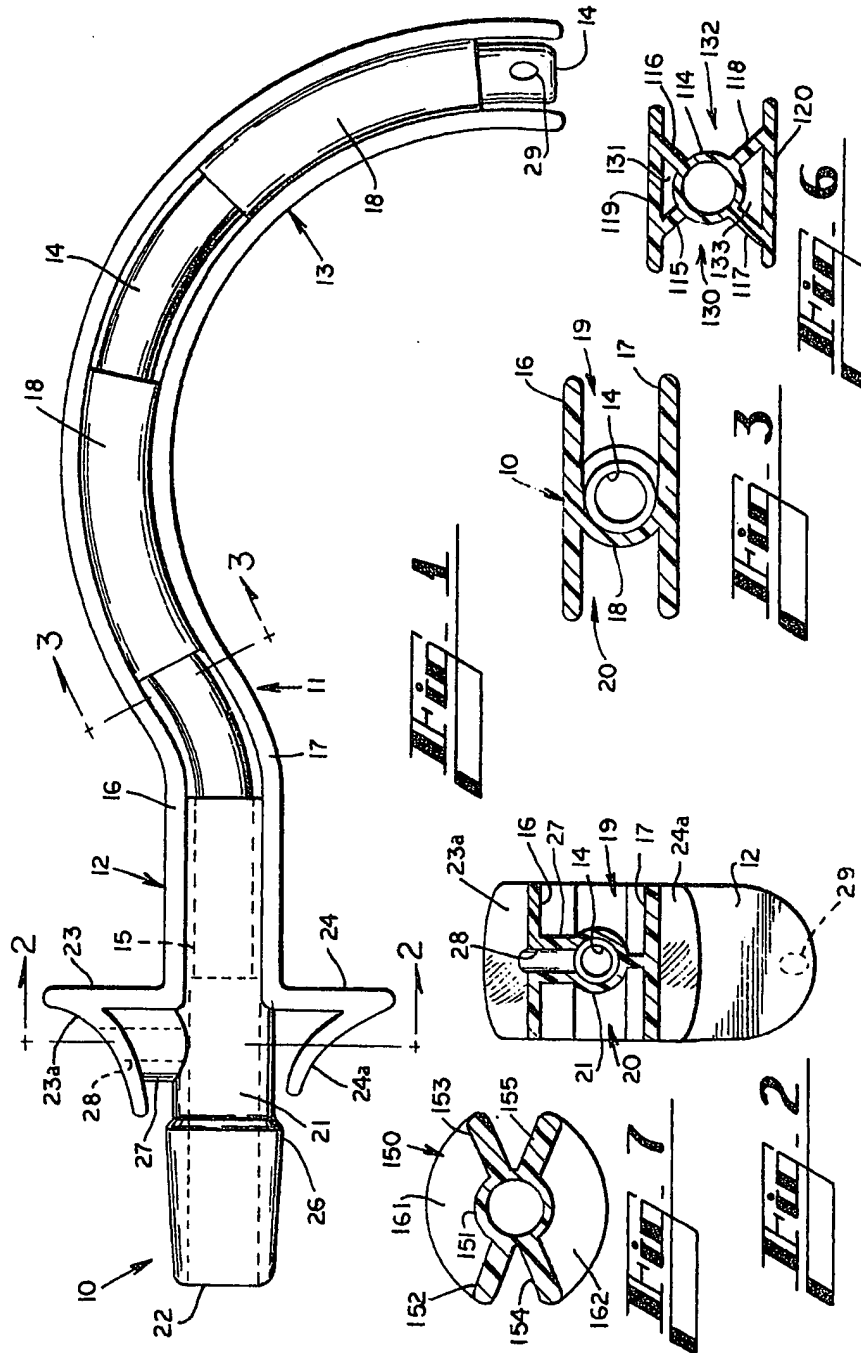
said flanges defining lip elements at the forward ends thereof for engaging the outside of a person's mouth;

one of said lip elements defining a radial suction control opening therein in communication with the interior of said rigid conduit; and

a flexible conduit extending along said body between said flanges and between said staggered tab elements to be frictionally received within the rearward end of said rigid conduit;

said rigid conduit defining at its forward end a tapered end for frictionally receiving a tube connected to a pump means.

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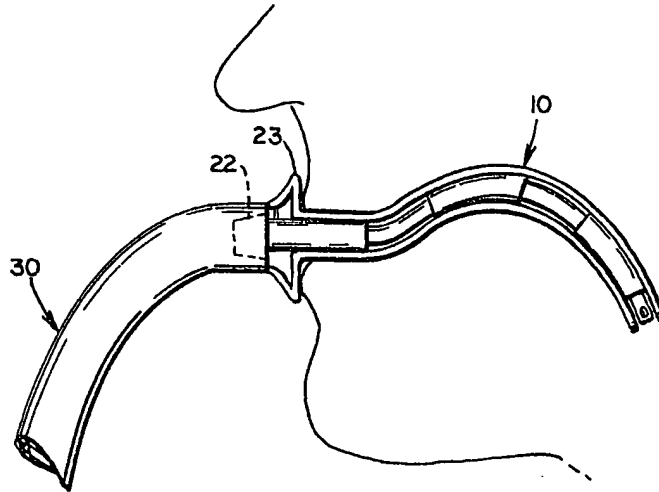


Fig. 4

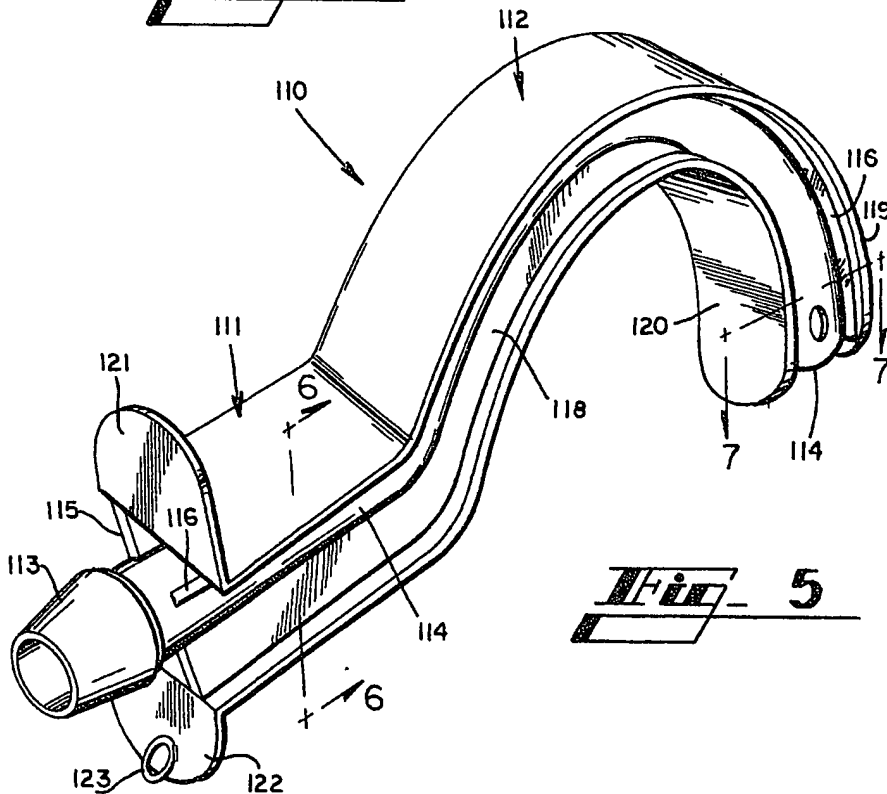


Fig. 5

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